Air Force Research Laboratory
Space Vehicles Directorate

Overview: The Air Force Research Laboratory's Space Vehicles Directorate leads the nation in space supremacy research and development. Our mission is to develop and transition innovative high-payoff space technologies supporting the warfighter, while leveraging commercial, civil and other government space capabilities to ensure America's advantage. The Space Vehicles Directorate consists of an integrated team military, civilian and on-site contractor personnel.

Organization: The Space Vehicles Directorate is comprised of three distinct divisions located at Kirtland Air Force Base, N.M.

Under the 2005 Base Realignment and Closure Act, the **Battlespace Environment Division** moved from Hanscom Air Force Base, Mass. to Kirtland in 2011. The division specifies, forecasts, mitigates and explores environmental impacts to U.S. space systems and operations. Research areas include space weather sensing and modeling, hyperspectral data exploration, hypertemporal imaging and space object surveillance. The division's Space Weather Center of Excellence also operates research facilities at Sunspot, N.M. and Gakona, Alaska.

High Frequency Active Auroral Research Program
Gakona, Alaska

The **Spacecraft Technology Division** develops next-generation spacecraft bus and payload technology elements to reduce cost, improve performance and enable new missions. The division's research areas include space qualifiable electronics; plug-and-play avionics; spacecraft components such as power generation and management, structural systems and guidance; navigation controls and autonomy technologies; and space-based advanced-sensor systems.

Balloon Payload Operation

The **Integrated Experiments and Evaluation Division's** primary mission is to develop and integrate ground, space and near-space experiments designed to assess and prove emerging technologies and concept of operations for military space applications. This is facilitated by modeling, simulation, technical analysis and military utility assessment, as well as robust satellite integration and test facilities, and balloon payload operations.

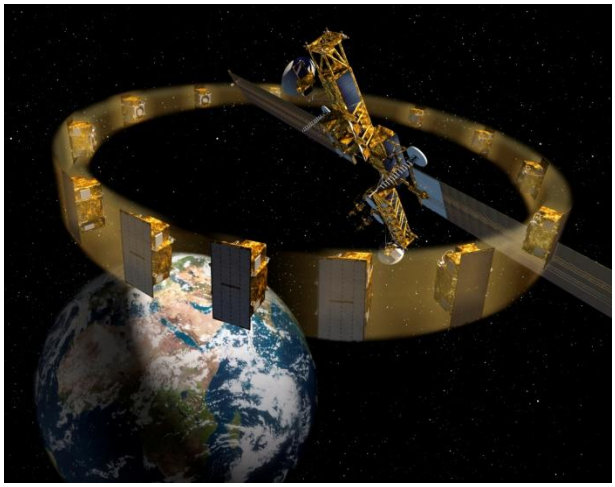
FACT SHEET Air Force Research Laboratory Space Vehicles Directorate 505.846.6315 www.kirtland.af.mil/afrl_vs

Current as of September 2011

Capabilities: Our capabilities and areas of expertise support intelligence, surveillance and reconnaissance, defensive space control, space situational awareness, responsive space and all areas of small satellite development. Additionally, the directorate provides substantial technical and educational outreach programs for students, such as the Space Scholars and University Nanosatellite Program.

C/NOFS

Programs: Three current programs of note include the Communication/Navigation Outage Forecast System (C/NOFS) satellite, the Tactical Satellite-3 (TacSat-3) and the Automated Navigation and Guidance Experiment in Local Space (ANGELS) spacecraft.



ANGELS

C/NOFS, launched in April 2008, demonstrates techniques for locating and forecasting ionospheric scintillations that disrupt communication signals.

TacSat-3, launched in May 2009, provides hyperspectral imaging with a low-cost satellite, and permits direct tasking by operational theater commanders. It is a significant building block for enabling Operationally Responsive Space. The technology was transitioned to the AF Space Command in July 2010 for use in the operational theater.

ANGELS is a space experiment to develop key understanding of safe and autonomous proximity operations and characterization at geosynchronous earth orbit.

Tactical Satellite-3

Current as of September 2011